

PROJECT NUMBER: 1758
PROJECT TITLE: Tobacco Cell Wall Research
PROJECT LEADER: G. H. Bokelman
PERIOD COVERED: June, 1988

I. ESTIMATION OF BLEND COMPOSITION FOR TWO NEW CIGARETTE BRANDS
(G. Bokelman, J. Stimler and General Analytical)

- A. Objective: As requested, predict the blend compositions of two new cigarette brands, American Spirit and Midwest.
- B. Results: The Santa Fe Tobacco Company has introduced American Spirit 85 Filtered and Nonfiltered cigarettes throughout the United States. These cigarettes are advertised as "100% additive-free Virginia tobaccos and nothing else." Based on our blend composition analysis (1), if the stem content represents bright stems, then the American Spirit cigarettes actually may contain 90% or more flue-cured tobaccos--but they do not contain 100% flue-cured tobaccos. We suspect that there may be a certain lack of process control, since these cigarettes are made for the Santa Fe Tobacco Company by another company (G. A. Georgopulo & Co., Inc., a specialty cigarette manufacturer in New York). The presence of small amounts of burley lamina and Oriental leaf might represent scrap contaminants, whether intentional or unintentional, from other cigarette runs.

Concern has been expressed regarding a new cigarette brand in a flip top box, Midwest, which may infringe upon both our package design and advertising copy for Marlboro (2). So far this brand has been offered for sale in Lebanon and has appeared at international trade shows in Holland, Sweden and Singapore. It is believed that this product may be produced in Greece. Except for a reduced content of Oriental leaf, the predicted blend composition of Midwest cigarettes was found to be similar to that of Greek Marlboro (2). It is interesting to note, based on a microscopic examination by Nancy Ryan, that the filler for Midwest cigarettes contained pieces of stem attached to the lamina, unlike other fillers. It may be that some form of whole-leaf cutting is utilized in the production of Midwest filler.

- C. Plans: In the near future we will compare the chemical compositions of selected U.S. and Chinese tobaccos.

D. References:

1. Bokelman, G. H. and J. O. Stimler, memo to J. E. Wickham, "Blend Composition of American Spirit, a Newly Introduced Brand," June 22, 1988.
2. Bokelman, G. H. and J. O. Stimler, memo to J. L. Charles, "Blend Composition of Midwest (Flip Top Box)," June 14, 1988.

II. SIDESTREAM REDUCTION (S. Baldwin, S. Tafur, G. Bokelman & B. Rogers)

- A. Objective: Develop research strategies in the area of sidestream reduction to be accomplished in the next 3 to 6 months.
- B. Plans and Results: Plans have been made to accomplish the following goals: (1) develop the capacity to produce both paper hand-sheets and bobbins of cigarette paper, (2) examine high surface area cigarette paper fillers for the condensation of sidestream smoke, (3) develop a protocol for the evaluation of sidestream reduction, (4) develop thin film coatings to decrease the porosity of cigarette paper, (5) examine the use of thermoplastic additives or coatings to diminish the emission of sidestream smoke occurring at the char line, (6) examine core vs. periphery effects of cigarette fillers to reduce the generation of sidestream smoke, and (7) modify the fiber used in order to decrease the porosity of the cigarette paper or otherwise reduce the emission of sidestream smoke.

To date numerous samples of fine particle size fillers and a variety of paper-coating polymers have been ordered, many of which already have been received. Also, to enhance our capabilities in this area, Sue Tafur attended a course on "Introduction to Pulp and Paper Technology."

Cigarettes have been prepared from a standard 25 g/m² basis weight paper which had been coated with approximately 0.5% and 1.0% carboxymethyl cellulose (CMC) 7LF, using size press coating. As expected, the porosity of the coated papers decreased. The static burn time increased in the CMC-treated cigarettes, but most other parameters were unchanged. No sidestream smoke measurements have yet been made.

C. Reference:

1. Bokelman, G. H. and R. S. Slagle, memo to R. N. Ferguson, "Proposed Research on Cigarette Papers and Filler Modifications for Sidestream Reduction," June 16, 1988.

III. BRIGHT NON-VOLATILE FRACTIONS (S. Tafur and M. Core)

- A. Objectives: Develop and apply methods for further separation of non-volatile tobacco fractions obtained from Flavor Development personnel.
- B. Results: The vacuum liquid chromatography procedures using C₁₈-silica and NH₂-silica were scaled-up to allow larger quantities of Fr IV to be processed to a subfraction highly enriched in selected glycosides. Preliminary subjective evaluations by Flavor Development of selected Bright fractions were conducted at levels of 0.5 mg add-on per cigarette. New samples also were supplied to allow evaluations at higher addition levels.

- C. Plans: The status of this research effort will be reassessed following completion of subjective evaluation of recently submitted samples.

IV. CHARACTERIZATION OF TOBACCO HEMICELLULOSE (S. Baldwin)

- A. Objective: Characterize hemicellulose isolated from green Coker 319 tobacco.
- B. Results: As part of a collaborative contract research project, Dr. Norman Lewis at VPI&SU sent us a crude sample of hemicellulose that had been extracted from green Coker 319 tobacco grown in the greenhouse at Philip Morris. Water "soluble" and insoluble fractions were obtained by centrifuging a suspension/solution of the starting material at 2000 rpm for 20 minutes to achieve a crude separation of the grossly insoluble material from the more soluble material. Neutral sugar analysis was carried out on both fractions, which had distinctly different compositions.

Recently an additional three samples of tobacco hemicellulose were received from Norman Lewis. Neutral sugar analysis revealed slight differences among the compositions of these three samples.

- C. Plans: The individual components within the various samples of tobacco hemicellulose will be isolated and more completely characterized.